

REMARKS:

This application has been carefully reviewed in light of the Office Action dated October 20, 2005. Claims 1–9, 11, 12, 14, 15 and 21–27 remain in the application, of which Claims 1, 22 and 26 are the independent claims currently under consideration. New Claims 26 and 27 have been added, and Claims 1 and 22 have been amended herein. Claims 10 and 13 have been canceled herein, without prejudice or disclaimer of subject matter. No new matter is believed to have been added with these amendments. Reconsideration and further examination are respectfully requested.

Initially, Applicants thank the Examiner for the indication that Claim 21 contains allowable subject matter. To expedite the prosecution of this application, without surrendering any equivalents, Applicants have added new independent Claim 26, which incorporates allowable subject matter of Claim 21 and is therefore believed to be in condition for allowance. New Claim 27 is dependent from independent Claim 26 and therefore is believed to be also in condition for allowance for at least the same reasons. Because a dependent claim is deemed to define an additional aspect of the invention, consideration of the dependent claim on its own merits is respectfully requested.

Claims 1 and 22 have been amended without introducing any new matter. The subject matter added to Claims 1 and 22 is fully supported by the original specifications and claims, including, for example, paragraphs [22] and [30].

Claims 1–15 and 21–25 were rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. To expedite the prosecution of this application, without surrendering any equivalents and without conceding the correctness of the rejection, independent Claims 1 and 22 have been amended to remove the language that is allegedly indefinite. Accordingly, the claims are believed to be definite, and Applicants therefore respectfully request reconsideration and withdrawal of the foregoing § 112, second paragraph, claim rejections.

Claims 1, 12 and 22 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 3,489,203 (“Fischell”); Claims 2, 3, 9, 10 and 13 were rejected under 35 U.S.C. § 103(a) over Fischell in view of the allegedly admitted prior art of ¶ 26; Claims 4–8, 14, 23 and 24 were

rejected under 35 U.S.C. § 103(a) over Fischell in view of the allegedly admitted prior art of ¶ 26 and further in view of U.S. Patent No. 6,164,077 (“Feger”); Claim 11 was rejected under 35 U.S.C. § 103(a) over Fischell in view of U.S. Patent No. 6,073,888 (“Gelon”); Claims 15 and 25 were rejected under 35 U.S.C. § 103(a) over Fischell in view of U.S. Patent No. 5,823,476 (“Caplin”). Reconsideration and withdrawal of these rejections are respectfully requested.

The present invention generally concerns a thermal control system for a spacecraft. With reference to the particular claim language, amended independent Claim 1 is directed to a thermal control system for a spacecraft, the spacecraft being characterized in part by a spacecraft bus supporting at least one instrument tending to generate heat, and one or more spacecraft thermal radiator panels spatially separated and kinematically isolated from the at least one instrument. The thermal control system includes at least one active cooler mounted or for being mounted to the spacecraft at a location spatially separated and kinematically isolated from the at least one instrument. The thermal control system further includes at least one kinematic mount for kinematically isolating the at least one active cooler from the at least one instrument. The at least one active cooler is thermally coupled between the at least one instrument and the one or more spacecraft thermal radiator panels or is for thermally coupling the at least one instrument and the one or more spacecraft thermal radiator panels. The at least one active cooler is for transferring heat from the at least one instrument to the one or more spacecraft thermal radiator panels.

Amended independent Claim 22 is directed to a system including an instrument platform, at least one instrument mounted on the instrument platform, the at least one instrument tending to generate heat, and at least one thermal radiator mounted at a location spatially separated and kinematically isolated from the at least one instrument. The system further includes at least one active cooler mounted at a location spatially separated and kinematically isolated from the at least one instrument, a thermal link thermally coupled between the at least one active cooler and the at least one instrument, and at least one kinematic mount for kinematically isolating the at least one active cooler from the at least one instrument. The at least one active cooler is for transferring heat from the at least one instrument to the at least one thermal radiator.

The applied references are not seen to disclose or suggest the features of independent Claims 1 and 22, particularly with respect to at least the features of (i) at least one active cooler, (ii) at least one kinematic mount for kinematically isolating the at least one active cooler from the at least one instrument and (iii) the at least one active cooler mounted or for being mounted at a location spatially separated and kinematically isolated from the at least one instrument.

Fischell is seen to be generally directed to a controlled heat pipe apparatus. Specifically, Fischell discloses a satellite having heat producing electronic equipment (16), strips (26), a heat pipe (18–20), and a radiator element (21). See Fischell, col. 2, ll. 16–39 and Fig. 1. The heat producing electronic equipment (16) is seen to be placed within and attached to the walls (11–13) of the satellite, to which the heat pipe (18) is also attached. See Fischell, Fig. 1.

Fischell does not disclose or suggest (i) an active cooler, (ii) a kinematic mount for kinematically isolating an active cooler from an instrument, or (iii) an active cooler for being mounted or mounted at a location spatially separated and kinematically isolated from the instrument. Fischell's elements (26, 20 and 21) are passive (not active). Unlike active coolers, Fischell's elements do not generate any vibration. Fischell, which is not concerned with vibration, does not disclose and cannot suggest any kinematic mount.

The Office Action appears to suggest that Fischell's elements (26, 20 and 21) of Figure 2 are spatially separated and mechanically isolated from the satellite electronics (42 & 67) in Figures 3 and 6. Applicants respectfully submit that the figures of Fischell are “of necessity schematic.” See Fischell, col. 2, l. 18. The satellite electronics (42 & 67) of Figures 3 and 6 are shown schematically to “float” and lack any apparent connection to any other portion of the satellite. Applicants believe these are only “schematic” figures, not depicting actual connections between the satellite electronics and the satellite. When these parts are assembled, because of gravity, the satellite electronics do not and *cannot* float. Therefore, the satellite electronics must be necessarily connected to the satellite itself, as shown in Figures 1 and 2 (even though *schematically* the connections are not shown in Figure 3 and 6). Because the satellite electronics are necessarily connected to the satellite and because Fischell does not disclose or suggest a kinematic mount, Fischell's elements (26, 20 and 21) cannot be kinematically isolated from the satellite electronics.

Accordingly, nowhere is Fischell seen to disclose, teach or suggest at least one active cooler, at least one kinematic mount for kinematically isolating the at least one active cooler from the at least one instrument, and the at least one active cooler mounted or for being mounted at a location spatially separated and kinematically isolated from the at least one instrument.

Feger, which was used in the rejection of certain dependent claims, is not seen to remedy the above deficiencies of Fischell. Feger is seen to be generally directed to a thermal link. Specifically, Feger discloses a thermal link device for use between a cryogenic machine and a load. See Feger, Abstract. Nowhere is Feger seen to disclose, teach or suggest at least one active cooler, at least one kinematic mount for kinematically isolating the at least one active cooler from the at least one instrument, and the at least one active cooler mounted or for being mounted at a location spatially separated and kinematically isolated from the at least one instrument.

Even if, assuming arguendo, an active cooler is known, and a kinematic mount is known, there is no suggestion or teaching in any of the applied references to make the particular claimed combination. Should the claim rejections are to be maintained, Applicants respectfully request that the next Office Action identify the specific teachings or suggestions that would have motivated one skilled in the art at the time of the invention to have made the particular claimed combinations.

Accordingly, the applied references are not seen to disclose, teach or suggest the combination of features of amended independent Claims 1 and 22, which are believed to be in condition for allowance.

The other claims currently under consideration in the application are dependent from independent Claims 1 and 22 discussed above and therefore are believed to be allowable over the applied references for at least the same reasons. Because each dependent claim is deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience.

Applicants' undersigned attorney may be contacted at the address and telephone number set forth below.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



Soyeon (Karen) Laub
Registration No. 39,266

18191 Von Karman Ave., Suite 500
Irvine, CA 92612-7108
Phone: 949.851.0633 SKL:JMN
Facsimile: 949.851.9348
Date: January 19, 2006
ORC 380287-3.070602.0021

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